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(54) Overload indicators

(57) A distance and overload indicator, particularly for indicating changes in the length of a spring under load, has an indicator element 7 which slides longitudinally in a longitudinal slot 6.

The indicator element is held in a socket in such a way that when the indicator element slides through more than a specified maximal distance, at least one transverse end-wall 20 of the slot shears off the indicator element or wrenches it out of its socket.

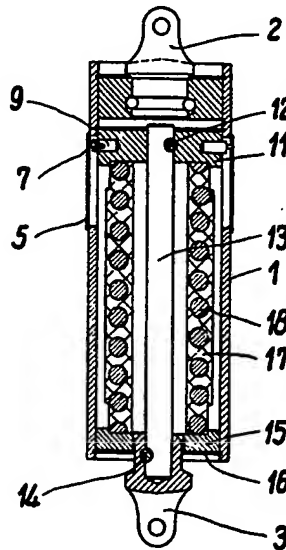


Fig. 2

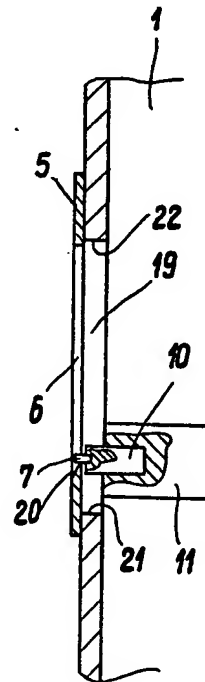


Fig. 4

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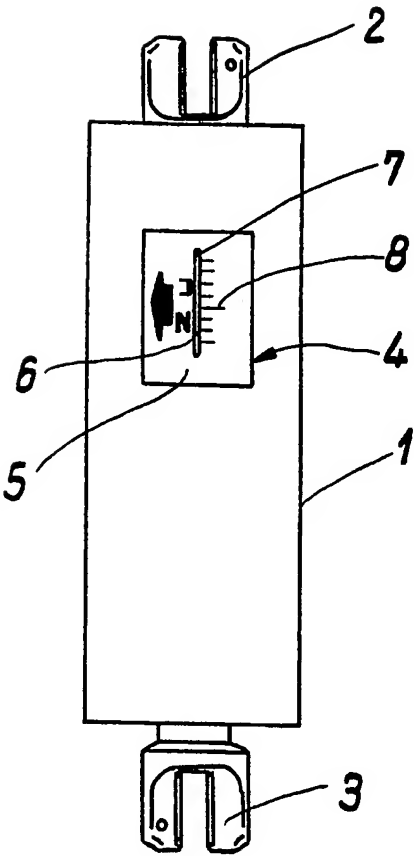
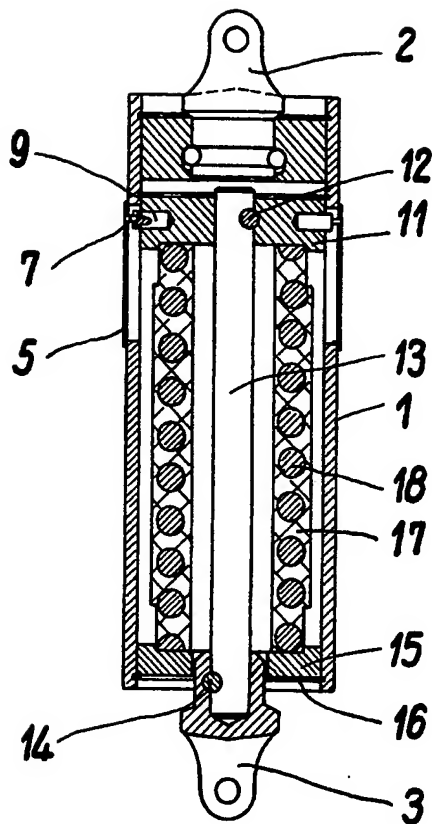


Fig. 1

*Fig.2*

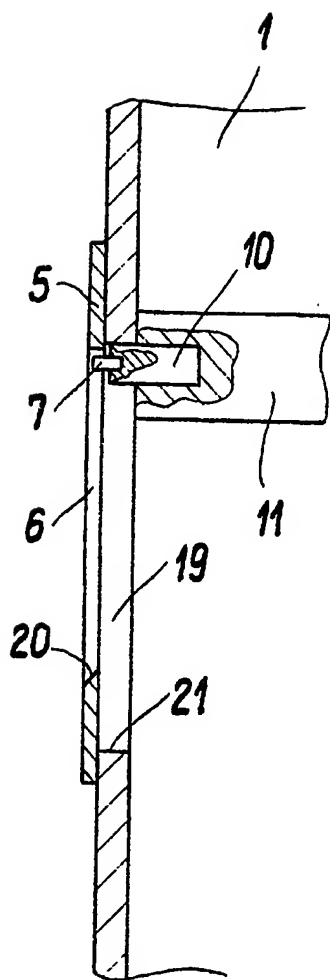


Fig. 3

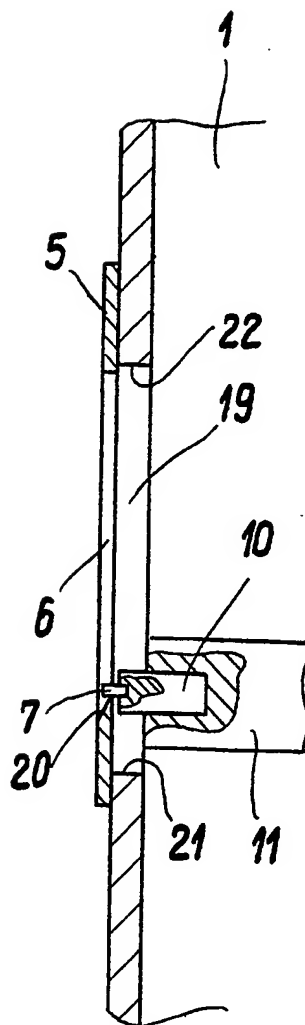


Fig. 4

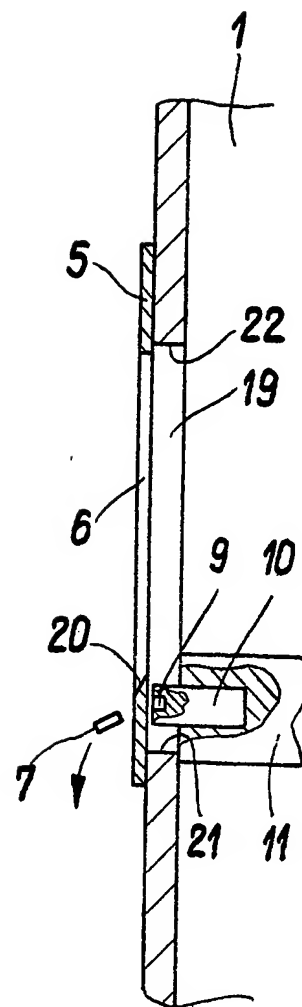


Fig. 5

SPECIFICATION

Distance and overload indicator

The invention relates to a distance and overload indicator, particularly for indicating changes in the length of a spring, with an indicator element which slides longitudinally in a longitudinal slot.

Distance Indicators of this kind are known, in which the position of the indicator element can be read out from a graduated scale positioned next to the slot.

And this is often all that is required. But in some cases it is necessary to obtain an irreversible indication that a specified maximal distance has been exceeded. This requirement occurs, in particular, where a structural part must not be extended beyond a certain point. For example, when a tensioning device is applied to a span of chain or the like it is desirable to interpose in the span an overload indicator for irreversibly indicating when the chain has been subjected to an impermissibly high tension.

The intention in the present invention is to provide a distance indicator of the kind described at the beginning, but which indicates in an enduring manner that a specified maximal distance has been exceeded.

The problem is solved according to the invention in that the indicator element is held at a socket in such a way that when the indicator element slides through more than a specified maximal distance, at least one transverse end-wall of the slot shears off the indicator element, or wrenches it out of its socket.

The distance indicator according to the invention has the advantage that although within normal limits the distance indicator merely indicates the distance through which the structural part has moved, nevertheless as soon as a permitted maximal distance has been exceeded, an enduring indication is given that this has occurred.

The invention will now be described in greater detail on the basis of the example shown in the drawing, in which :

Figure 1 is a front view of a spring buffer containing a distance indicator;

Figure 2 is a longitudinal section through the spring buffer of Figure 1;

Figure 3 shows a detail, with the distance indicator in a first position;

Figure 4 shows the distance indicator in a second position;

Figure 5 shows the distance indicator in a third position, after the permissible distance has been exceeded.

In Figure 1 the housing 1 of a spring buffer is equipped with two connector heads 2 and 3 for connecting to chains, cables or the like. On each of two opposite sides the housing 1 has a distance indicator 4 whose cover plate 5 contains a longitudinal inspection slot 6 in which moves up and down, as seen in the figure, an indicator pin 7 co-operating with a read-out scale 8.

As shown in Figures 2 to 5, each indicator pin 7

is retained in a socket 9 in a stud 10 projecting laterally from a sliding thrust plate 11. Seated in a central axial bore in the sliding thrust plate 11, and secured by a cotter 12, is the upper end of a tension rod 13 whose lower end is secured in the bore of a connector head 3 by a cotter 14.

The lower end of the housing 1 is closed by a thrust plate 15 retained by a split spring ring 16 and containing a central passage for the tension rod 13. Acting between the two thrust plates 11 and 16 is a compression spring 18 vulcanized into a rubber body 17.

Tension applied in opposite directions to the connector heads 2, 3 pulls the tension rod 13 downwards in the housing 1, against the influence of compression spring 18, so that each indicator pin 7 slides downwards in its inspection slot 6, indicating the increasing tension on the read-out scale 8. In this movement the studs 10 slide downwards in longitudinal slots 19 of the housing 1, these slots 19, positioned under the cover plates 5, acting as guides for the studs 10 and for the sliding thrust plate 11.

As soon as the tension applied, in opposite directions, to the two connector heads 2, 3 exceeds a specified permissible limit, each indicator pin 7, striking the suitably constructed lower transverse end-wall 20 of its inspection slot 6, as represented in Figure 4, is sheared off, or wrenched out of its socket 9 in the sliding stud 10, as represented in Figure 5.

Subsequently, even if the tension is relaxed so that the sliding thrust plate 11 returns to its initial position, represented in Figure 3, the operator of the distance indicator can still deduce from the fact that the indicator pins 7 are missing, that overloading of the cable, strap or chain has occurred. To rectify the matter he can, for example, put the length of chain which has been overloaded out of service.

The lengths of the longitudinal guide slots 19, which guide the studs 10, determine the stroke of the sliding thrust plate 11. The difference in length between the inspection slots 6 and the guide slots 19 depends on the particular requirements.

The distance indicator according to the invention provides effective overload control for cables, straps, chains and the like, considerably improving safety in operation. A further application of the invention could be, for example, for indicating when a shock absorber is no longer serviceable.

CLAIMS

1. A distance and overload indicator, particularly for indicating changes in the length of a spring, with an indicator element which slides longitudinally in a longitudinal slot, characterised in that the indicator element is held in a socket in such a way that when the indicator element slides through more than a specified maximal distance, at least one transverse end-wall of the slot shears off the indicator element or wrenches it out of its socket.

2. A distance indicator according to claim 1,

characterised in that the transverse end-wall of the slot has a cutting edge.

3. A distance indicator according to claims 1 or 2, characterised in that the socket is a recess in a projection of a mobile part.

4. A distance indicator according to claim 3, characterised in that the projection slides longitudinally in a longitudinal slot situated behind and parallel to the slot for the indicator element.

5. A distance indicator according to claim 4, characterised in that the two transverse end-walls of the longitudinal slot for the projection act as stops for limiting the stroke of the mobile part.

6. A distance indicator according to claims 3 to 5, characterised in that the projection is a stud fixed in the mobile part.

7. A distance indicator according to claims 1 to 6, characterised in that the indicator element is secured to a mobile part whose movements are influenced by a spring.

8. A distance indicator according to claim 7, characterised in that the mobile part is connected to a connector head of a spring buffer for cables, straps and/or chains.

9. A distance indicator according to claims 1 to 8, characterised in that the distance indicator is used as an overload indicator in a tensioning device for cables, straps and/or chains.

10. A distance indicator according to claim 1 and substantially as described with reference to the accompanying drawings.